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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/720,230	12/19/2000	Herman Wouter Van Rumpt	ITOM001128	9268

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EXAMINER	
LE, LANA N	

ART UNIT	PAPER NUMBER
2685	5

DATE MAILED: 02/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/720,230	VAN RUMPT, HERMAN WOUTER	
	Examiner	Art Unit	
	Lana Le	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7-9,12 and 14-20* is/are rejected.

7)☒ Claim(s) *2,3,5,6,10,11 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Headings of each part of the specification should be labeled as in the format below, i.e. Field of the Invention, Background of the Invention, Summary of Invention, Brief Descriptions of the Drawings, and Detailed Description of the Preferred Embodiment, Claims, Abstract of The Disclosure. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 4, 7-9, 12, 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sears (US 6,122,492) in view of Janning (US 6,166,643) and further in view of Waraksa et al (US 5,515,036).

Regarding claim 1, Sears discloses a communication device including a power amplifier for amplifying a modulated high frequency carrier input signal comprising a resonance circuit arranged between resonance circuit input means and antenna means 112A, 112B characterized in that the resonance circuit input means comprise an excitation circuit 101 for a periodic excitation of the resonance circuit phase and/or frequency coupled with the modulated high frequency carrier signal. Sears didn't further disclose the power amplifier comprising a resonance circuit arranged between resonance circuit input means and antenna means and the periodic excitation substantially occurring with a duty cycle less than 50%. Janning further discloses a resonant circuit 40 between the resonant circuit input means 42 and antenna means 44 (fig. 2b; col 13, lines 45-61), the periodic excitation substantially occurring with a duty cycle less than 50% (col 17, lines 17-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the periodic excitation occurring with a duty cycle less than 50% in order to improve the efficiency of the power amplifier and to reduce phase errors.

Janning and Sears didn't further disclose:

the device is characterized by said excitation occurring within excitation periods (Tex) in a periodic alternation with resonation periods (Tfre); during which the resonance circuit is in free running resonance mode, the excitation periods being smaller than the resonation periods. Waraksa et al further discloses the device is characterized by said excitation occurring within excitation periods (Tex) in a periodic alternation with resonation periods (Tfre); during which the resonance circuit is in free running

resonance mode, the excitation periods being smaller than the resonation periods (col 16, lines 57- col 17, line 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the excitation occurring within excitation periods in a periodic alternation with the resonance periods in order to time the excitation drive signal to happen in the same peak area as the sinusoidal carrier signal.

Regarding claim 4, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1, Janning further discloses the device is characterized by the excitation duty cycle (Tex/Tcar) being defined to decrease with increasing quality factor (Q) of the resonance circuit and vice versa for an excitation duty cycle (Tex/Tcar) above an order of magnitude of 0.1(col 14, lines 1-2).

Regarding claim 7, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1 wherein Warkasa et al further discloses characterized by a discontinuity in the slope of the signal occurring in the resonance circuit during the resonation periods at the start of the excitation periods (col 16, lines 57- col 17, line 7).

Regarding claim 8, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1 wherein Warkasa et al further discloses a communication device according to claim 7, characterized by an inherent DC level shift causing said discontinuity to occur.

Regarding claim 9, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1 wherein Janning further discloses the communication device is characterized in that the excitation circuit comprises a

controllable switching device serially arranged with the resonance circuit between first and second terminals of a voltage supply source and having a control terminal coupled to the input of the power amplifier for periodically supplying an excitation voltage signal, to the resonance circuit, phase and/or frequency coupled with the modulated carrier signal circuit (col 18, lines 15-20).

Regarding claim 12, Sears, Janning et al and Warkasa et al a communication device according to claim 1 wherein Sears further discloses characterized by amplitude modulation means for modulating the amplitude of the supply voltage between the first and second terminals of the voltage supply source with modulation signal dependent envelope amplitude variations of the modulated high frequency carrier signal (col 7, lines 27-58).

Regarding claim 14, Sears, Janning et al and Warkasa et al discloses communication device according to claim 13, Janning further discloses the device is characterized in that an output stage of the charge pump comprises a bipolar transistor 121, the collector emitter path thereof being serially coupled to the resonance circuit between first and second terminals of a supply voltage source (col 7, lines 40-48; fig. 2b).

Regarding claim 15, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 13, wherein Sears further discloses the device is characterized by amplitude modulation means for modulating the excitation signal as well as a supply voltage modulation means coupled to the resonance circuit with

modulation signal dependent envelope amplitude variations of the modulated high frequency carrier signal (col 7, lines 27-58).

Regarding claim 16, Sears, Janning et al and Warkasa et al disclose a communication device according to claim 1, wherein Sears further discloses characterized in that the resonance circuit input means comprises a pulse generator 104 controlling the excitation circuit via pulse width control signal 409 to modulate the excitation signal in its phase and/or frequency and/or envelope amplitude in correspondence with the modulated high frequency carrier signal (fig. 1; col 7, lines 4-9).

Regarding claim 17, Sears, Janning et al and Warkasa et al disclose a communication device according to claim 1, wherein Janning et al further discloses characterized by the resonance circuit having a resonance filter quality factor greater than 1 (col 21, lines 9-15).

Regarding claim 18, Sears, Janning et al and Warkasa et al disclose a communication device according to claim 1, wherein Janning et al further discloses characterized by a balanced implementation of the excitation circuit 42 and the resonance circuit 40 (col 7, lines 30-40).

Regarding claim 19, Sears, Janning et al and Warkasa et al disclose a communication device according to claim 1 wherein Janning et al further discloses characterized in that the resonance circuit comprises a parallel RLC circuit comprising an inductor and resistor provided with a tapped coupling to the antenna impedance (col 20, lines 43-50).

Regarding claim 20, Sears, Janning et al and Warkasa et al disclose a communication device according to claim 1, wherein Janning et al further discloses characterized in that the resonance circuit comprises a parallel RLC circuit comprising an inductor is provided with a tapped coupling to an antenna device (fig. 2b).

Allowable Subject Matter

2. Claims 2-3, 5-6, 10-11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, Sears, Janning et al and Warkasa et al further discloses a communication device according to claim 1 wherein the cited prior art fails to further disclose the device is characterized by the resonance circuit having a resonance frequency (fres) higher than the carrier frequency (fcar) of the modulated high frequency carrier signal over a resonance frequency detuning rate (dfres), defined by the frequency deviation of said resonance frequency from said carrier frequency relative to the carrier frequency (frea/fcar-1), substantially at most corresponding to half the excitation duty cycle.

Regarding claim 3, Sears, Janning et al and Warkasa et al further discloses communication device according to claim 1, wherein the cited prior art fails to further disclose the device is characterized by said resonance frequency detuning rate (dfres)

being in the order of magnitude of the half square value of said excitation duty cycle (Tex/Tcar) for an excitation duty cycle above an order of magnitude of 0.1.

Regarding claim 5, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1, wherein the cited prior art fails to further disclose the device is characterized by an excitation duty cycle (Tex/Tear) and a resonance frequency detuning rate (Ores=fres/fcar-1) being substantially defined by:

$$(Tex/Tcar)[Q] = \frac{\sqrt{1-(1-\frac{1}{Q})^{4}}}{2\pi(1-\frac{1}{Q})\left(\frac{\sqrt{1-(1-\frac{1}{Q})^{4}}}{2\pi(1-\frac{1}{Q})^{2}} + \frac{3+\frac{2\arcsin[(1-Q)^{\frac{1}{2}}]}{\pi}}{4}\right)}$$

Regarding claim 6, Sears, Janning et al and Warkasa et al discloses a communication device according to claim 1, wherein the cited prior art fails to further disclose the device is characterised by a resonance frequency detuning rate (dfres=fres/fcar-1) being substantially defined by:

$$dfres[Q] = 0.5\left(\sqrt{1-(1-\frac{1}{Q})^{4}} + 3 + \frac{2\arcsin[(1-\frac{1}{Q})^{\frac{1}{2}}]}{\pi}\right)$$

$$\left[\frac{1}{2\,Pi\,(1 - \frac{2}{Q})} - \frac{1}{4} \right]$$

Regarding claim 10, Sears, Janning et al and Warkasa et al further discloses a communication device according to claim 9, wherein the cited prior art fails to further disclose the device is characterized in that the controllable switching device comprises a switch resistance serially arranged with the resonance circuit between the first and second terminals of said voltage supply source and being varied from a maximum resistance value to a minimum resistance value and vice versa to smoothen transits of said excitation voltage signal increasing above a threshold voltage within the excitation periods.

Regarding claim 11, the cited prior art fails to further disclose a communication device according to claim 10, wherein the device is characterized in that the controllable switching device comprises a MOS transistor having its drain source path serially coupled to the resonance circuit being controlled to vary the switch resistance stepwise.

Regarding claim 13, Sears, Janning et al and Warkasa et al further disclose a communication device according to claim 1, wherein the cited prior art fails to further disclose the device is characterized in that the excitation circuit 101 comprises a charge pump supplying an excitation current signal, phase and/or frequency coupled with the modulated carrier signal circuit 104 having continuous transients between a minimum and a maximum current level, and increasing above a threshold current level within the excitation periods.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana Le whose telephone number is (703) 308-5836. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le

February 9, 2004

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